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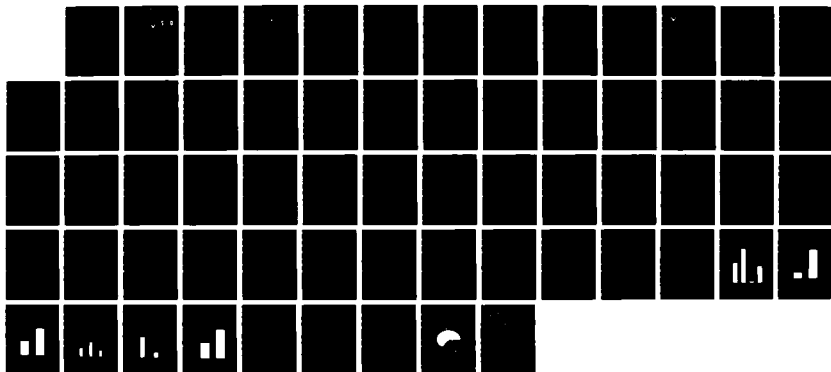
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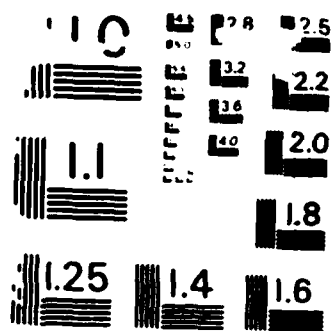
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STUDENT REPORT

CAPABILITIES AND APPLICATION OF A
DEDICATED CONVENTIONAL BOMBER FORCE
IN 1993

MAJOR JAMES R. THOMITS

88-2560

"insights into tomorrow"

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REPORT NUMBER 88-2560
TITLE CAPABILITIES AND APPLICATION OF A DEDICATED
CONVENTIONAL BOMBER FORCE IN 1993

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Submitted to the faculty in partial fulfillment of
requirements for graduation.

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PREFACE

During my fourteen years in the Strategic Air Command, I have had the opportunity to develop a unique perspective on the use of the strategic bomber force in conventional warfare. The perspective I developed as a young crewmember, through my association with the combat veterans returning from Southeast Asia, was refined and modified by the experience gained as a Conventional Bomber Planner while at Strategic Air Command Headquarters. In this capacity, I had the opportunity to discuss the principles of bomber application with all echelons of both the Air Force and joint communities while participating in exercises, training sessions, and planning conferences. As a weapons officer and Chief of an Operations Division at Mather AFB, I was able to implement many of my ideas and discuss their success, or failure, with bomb wing personnel and the SAC staff.

Over the years, I have developed a deep concern over the readiness of the command to fight in a conventional conflict and the ability of theater commanders to successfully integrate the valuable and extremely flexible bomber asset into their war plans. I am concerned over the survivability of the bomber force using present day capabilities and tactics in a heavily defended theater; the reluctance of SAC planners to develop realistic employment plans and develop the capabilities to carry out these plans; and the reluctance of the theater CINCs to rely on the availability of the bomber force due to its nuclear deterrent role.

In this study, I have attempted to present one person's biased opinions on how to most effectively apply a dedicated strategic bomber force, improved with present day technologies, in what might be considered a representative scenario. It is not designed to be an in-depth analysis of the future of the bomber force in conventional warfare. Due to time, space, and classification restrictions, this is by necessity a cursory examination of future bomber capabilities to assist the theater commander in carrying out his mission. My hope is that it might be used as a point of departure for SAC planners to begin to think about conventional wars and to begin to improve the conventional forces of the command and the nation.

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—ABOUT THE AUTHOR—

Major James R. Thomits developed his beliefs on the role and most effective application of the SAC bomber force in a conventional role while performing in a wide variety of aircrew and staff positions during fourteen years in the Strategic Air Command. His first assignment, as a B-52 crewmember, provided the opportunity to obtain the perspective of individuals returning from Guam and U-Tapao who had flown combat missions in Vietnam. Assigned to the Strategic Air Command Headquarters in 1980, he served as a planner in the Southwest Asian Contingency Plans Branch and the Contingency Initiatives Division. In these positions, he was actively involved in all aspects of conventional plans, exercises, and operations dealing with B-52, B-1, KC-135, KC-10, SR-71, and RC-135 aircraft. He developed three Operational Plans in support of USCENTCOM and was the primary planner for the Strategic Air Command's participation in BRIGHT STAR 82. He was selected to author CINCSAC's 1983 CORONA FALL briefing on SAC conventional plans and capabilities. In 1984, he returned to flight duties with the 320th Bombardment Wing, Mather AFB, Ca. where he served as a flight commander, weapons officer, and Chief of the Operations Division. In these capacities, he was responsible for training crews and developing plans in support of over 400 conventional training, exercise, and operational missions per year. He holds a bachelor's degree from the University of New Hampshire and a Master of Arts in Management degree from Golden Gate University. He completed Air Command and Staff College by correspondence in 1981 and the National Security Management Course by correspondence in 1986. He is a graduate of the Joint Operational Planning System (JOPS) Users Course, the Strategic Air Command's Weapons Course and COMINELWARCOM's Minefield Planners Course.

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EXECUTIVE SUMMARY

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REPORT NUMBER 88-2560

AUTHOR(S) MAJOR JAMES R. THOMITS, USAF

TITLE CAPABILITIES AND APPLICATION OF A DEDICATED CONVENTIONAL BOMBER FORCE IN 1993

I. Purpose: To identify and demonstrate the capabilities and most effective application of a dedicated conventional bomber force, enhanced with present day technologies, in a theater conventional conflict.

II. Problem: The removal of Intermediate Range Ballistic Missiles, and possible total denuclearization of Europe, presents conventional balance of force implications for NATO to address in the short term. This is particularly true in light of the fiscal constraints. One alternative to be considered is to enhance the capabilities of forces already in existence rather than incurring the expense of developing entirely new forces. Updating a portion of the SAC bomber force with presently available or programed weapons and technologies and dedicating this force to conventional operations

CONTINUED

conventional operations should be considered. This would be a should be considered. This would be a relatively low cost alternative to increase the theater commander's warfighting capabilities. This concept would require removal of a portion of the bomber force from its Emergency War Order (EWO) responsibilities, an investment in avionics and aircraft updates, and a significant investment on the part of the Strategic Air Command in weapons development and procurement. Additionally, concepts of operations must be developed to maximize the effectiveness of the force and to integrate the bomber force into multiple theater war plans.

III. Data: NATO has historically relied on a layered approach for its defense to include the early introduction of theater nuclear weapons to blunt a Soviet attack of Western Europe. Removing, through a series of negotiated agreements, the nuclear deterrent from Europe will create a situation where NATO must rely upon an inferior conventional warfighting capability for its defense. A series of studies have been accomplished detailing requirements to expand and modernize NATO's conventional forces. Each of these studies point out only a massive infusion of capital would bring the NATO conventional force up to parity with the Warsaw Pact forces. This expenditure is something the nations of Western Europe have heretofore been unwilling to contribute. The B-52 force, updated with (1) avionics improvements such as integrating the Global Positioning System into the navigation and bombing system of the aircraft and improved sensors to enhance the targeting and tracking capabilities, (2) aircraft modifications such as expanding the bomb bay to increase the weapons carriage capability of the aircraft and the modification of the aircraft with the Common Strategic Rotary Launcher to provide greater operational flexibility, and (3) weapons improvements such as developing the capability to deliver a family of presently available (or programed in the short term) stand-off weapons to enhance the aircraft's survivability and capabilities in a wide range of missions and scenarios.

IV. Conclusions: A dedicated bomber force updated with presently available technologies could provide theater commanders a greatly expanded conventional capability and, properly applied, could help address the significant conventional force imbalance which presently exists.

V. Recommendations: The Strategic Air Command accelerate its efforts to establish a viable and dedicated conventional force through updated weapon delivery capabilities, doctrine, and integration of the force into the theater CINC's Operational Plans.

Chapter One

INTRODUCTION

BACKGROUND

Over the past few months, it has become increasingly obvious the successful completion of a series of nuclear force reduction agreements will be the highest foreign policy priority for the remainder of Ronald Reagan's presidency. The recently completed Intermediate Range Nuclear Force (INF) Reduction Treaty appears to be the cornerstone the President will build a broad program of nuclear and conventional force reductions. The administration appears to believe that the INF treaty will provide the impetus for a wide range of nuclear and conventional force reduction packages. These include a reduction in the number of strategic warheads and/or delivery platforms by way of the Strategic Arms Reduction Talks (START) and the completion of a long stalled Mutual and Balanced Force Reduction (MBFR) package. The stated objective of the administration is to provide a more stable world order where the threat of nuclear and conventional war is significantly decreased.

The rapid movement obvious on the part of both sides is very much out of character. The intransigence of the Soviet Union has been replaced by a headlong rush to dismantle an entire class of nuclear missile from their arsenal in the European theater. The push on the part of a conservative president who had viewed the Soviet Union as an "evil empire" and the archenemy of the United States has resulted in alienation of many of his long time right wing supporters. The history of arms negotiations between the two superpowers has been one of long drawn out discussions with either no substantial progress or mixed results unacceptable to the Senate, who has to ratify any treaty. The MBFR talks between NATO and the Warsaw Pact have been underway in Vienna since 1973[1] with no reduction in the conventional capabilities of the two adversaries, and a substantial improvement in the quantity and quality of the forces facing each other in Europe. The signing of the first Strategic Arms Limitations Treaty (SALT I) in 1973 produced a flurry of American arms control activity in the air of optimism which followed. However, very little has been accomplished in the years since.[2] Additionally, there have been numerous violations of the letter or intent of the treaties by both sides. The 10 March 87 Report of Soviet Noncompliance points to a

pattern of continual and blatant noncompliance on the part of the Soviets of eight arms control agreements.[3] President Reagan has also gone over the limits of the (unratified) SALT II arms control agreement. These intentional violations cause distrust of any future arms reduction treaty. Is this sudden flurry of arms control activity a new beginning of the military and political relationships leading to a better understanding of the security needs of the two powers? Or are there other more diabolical and self-serving motives driving the United States and the Soviet Union toward force reductions?

Advocates of a reduction in the nuclear arsenal in general, and the Intermediate Range Nuclear Force reduction package in particular, point to the change in leadership style apparent in the General Secretary of the Soviet Union, Mikhail S. Gorbachev appears far more open and willing to compromise than any of his predecessors. They feel that Gorbachev is a new type of Soviet leader. He represents a new generation of politician unencumbered by the policies and the historic distrust of the United States which drove the policies of his predecessors. They point to the rhetoric of the Secretary General and the liberalization of the Soviet society which has taken place with Gorbachev at the helm.[4] They embrace the policies of Glasnost and Perestroika as a new direction in the thought and policy of the Soviet leadership. The openness and economic liberalization of the new regime requires deemphasizing the importance of the military in the Soviet Union, and new methods when dealing with the West. Historically, when relations with the Soviets are going well, Americans get caught up in a wave of optimism and feel that every event could lead to a better world. We saw this happen during the 1970s during the era of detente when another "archenemy" of world communism (Richard Nixon) was making great headway in dealing with both Russia and China. Today, many believe the INF Treaty will be the event leading to better relations between the two superpowers and ultimately an arms deal that will reduce or eliminate nuclear weapons. Unfortunately, these beliefs do not coincide with the history of negotiations with the Soviet Union, the ever increasing and unprecedented build up of conventional and strategic nuclear forces by the Soviets, or the 1984 pronouncements of their leader, Mikhail Gorbachev. "In the face of imperialism's increased aggressiveness we have to be on our guard and strengthen our defense as never before." [5] When one looks at such pronouncements, the history of Soviet compliance with past treaties, and the Soviet's ability to make every treaty benefit their strategic objectives, it is clear one must be wary when entering into a treaty with them.

On the other side of the coin are those believing that we are negotiating for all the wrong reasons, and ultimately, we will accept a treaty unfavorable to our objectives in the region and ultimately tip the balance of power in the European theater towards the Russian side. PD-50, a White House Directive signed by Ziauw

Brezinski in 1979, acknowledged arms control was shaping defense policy rather than emanating from it.[6] Rather than conducting arms control negotiations with the goal of a more stable world and as an integral part of the overall foreign policy, the goal is instead a successfully negotiated treaty for political purposes. Rather than having direct inputs to the arms control process, the United States military is forced to work with whatever arms controls are forced upon them. The detractors of the arms control process believe this policy is being continued in the Reagan administration by making arms control an end to itself for political purposes rather than an instrument of foreign and military policy.

The INF treaty is viewed by some as putting the defense of Europe and the very structure of NATO at risk. They believe trading away our intermediate range nuclear missiles goes against the historically espoused strategy for the defense of Europe. The alliance has embraced the concept of "flexible response" as a strategy for twenty years.[7] Under the strategy of flexible response, a Soviet attack on Western Europe would be met with an ever escalating response up to and including battlefield and theater nuclear weapons. General Bernard W. Rogers, formerly Supreme Commander Allied Powers Europe (SACEUR), sees the INF treaty as inherently flawed and as the "first step down the slippery slope of European denuclearization." [8] This "zero option" is seen by Rogers as a step toward neutralizing of Germany (some like the word "Finlandizing") and would leave the alliance dependent on either its inferior conventional capabilities or strategic nuclear weapons to deter a conventional Soviet attack.

As to possible Soviet motivation, history has shown that the Soviets have used the negotiating process as an integral part of their plan to obtain their military and political objectives. They have successfully used the "art" of negotiating as an integral and primary instrument of state policy and as a weapon against the West in pursuit of their goal of global hegemony. Since the end of World War II, the Soviets have systematically achieved at the negotiating table what they were not able to achieve through political or economic coercion or the outright use of military power.[9] The Soviet's agenda during negotiations is not the same as that of the United States. Therefore, we must examine critically the negotiation process in depth to determine what objectives they are actually attempting to achieve. Their objectives may not be readily apparent, but ultimately they are designed to shift a balance of power toward the Soviet Union. This is readily apparent when one views the Anti-ballistic Missile Treaty, SALT I and SALT II.[10] Additionally, when it has been advantageous to the objectives of the Soviet Union, they do not feel compelled to comply with either the intent or the letter of a negotiated treaty.[11]

STATUS

The INF treaty is a fait accompli in spite of the objections of many of this nation's military and civilian leaders. The treaty has been signed by the leaders of the two nations and public sentiment will push the Senate toward rapid ratification. In light of this reality, two questions must be answered by our military and civilian leadership concerning the defense of Europe. First: What are the implications of the INF treaty on the military balance of power in Europe? Second: What steps can be realistically taken to maintain the current stable balance of power which has preserved the peace in Europe for over 40 years?

MILITARY BALANCE

How does the treaty affect the military balance of power in Europe? On the surface, the treaty would appear to be a significant achievement for the United States and its allies. It will ultimately remove all missiles with a range of between 300 and 3125 miles from the theater.[12] From a strictly "bean counting" point of view, it would appear the NATO got the best of the deal. The treaty will result in the removal of 1267 Soviet warheads from Europe in return for the removal of 412 warheads by the United States, a three to one advantage in favor of NATO.[13] However, the numbers are not as important as the missions the missiles would accomplish. From this perspective, the strategic implications weigh most favorably toward the Soviet Union. First, (and many believe foremost in the Russian mind) it moves the threat of nuclear attack on the Soviet homeland out of the realm of theater conflict and into the strategic arena. The introduction of the Pershing 2 missile into the theater had changed significantly the calculus of war in the Central European theater. Because of its range, accuracy, and mobility it introduced a new dimension to the balance of power in the central region. It represented, as General Rogers pointed out, "the one weapon of which the Russians have been truly afraid".[14] The system provided NATO the capability to attack Soviet cities with an accurate and mobile weapon. It would be extremely difficult to target and would be capable of surviving an initial attack and striking back at the Russian motherland. With the removal of the Pershing missile, the only remaining nuclear threat to the Soviet population and industrial base are the strategic assets of Britain, France, and the United States. Most experts believe these assets would not be used for the defense of Europe. The Soviets have no such targeting problem. Most of the major population and industrial centers of Western Europe are well within the range of Soviet short range and battlefield nuclear weapons stationed in East Germany. The Soviets have a devastating advantage in nuclear artillery, short range missiles and aircraft capable of delivering nuclear warheads in the theater (Figures 1&2) Richard Nixon and Henry Kissinger pointed out the importance

of these systems when they wrote in 1987 that "our missile's real function was to discourage Soviet nuclear blackmail of Europe and to raise the risk of nuclear retaliation on Soviet conventional attack." [15] As a result of the INF treaty the risk of nuclear retaliation to the Soviet "Rodina" has been effectively removed.

A second problem is the significant advantage the Soviets/Warsaw Pact maintain in the area of conventional force strength. Without the ability to rely on nuclear weapons for defense, NATO must depend on its conventional strength. In terms of sheer numbers, the NATO forces are at a severe disadvantage. In terms of strictly the ground forces available, the Warsaw Pact maintains 230 divisions while NATO maintains 120 (Figure 3). Additionally, the Soviets maintain a significant quantitative warfighting superiority in almost every important area (Figures 4&5). [16] Recent trends in Soviet war production point to a continuation of this unfavorable balance (Figure 6). [17] "Soviet/Warsaw Pact doctrine stresses the use of massive, superior forces in surprise operations." [18] The forces of the Soviet Union in being are ideally suited to support this doctrine and, properly applied, could inflict a devastating first strike in Europe with little or no fear of nuclear retaliation against their homeland. Many would point to the technological superiority of the NATO forces. However, this is an old argument and this advantage has been significantly eroded in recent years (Figure 7). The aggressive research and development program of the Soviets (Figure 8) makes it obvious that Western technology will not be capable of deterring the massed Soviet forces for very long. David Alishire, United States Permanent Representative to the North Atlantic Council, espoused his pessimism when he testified before Congress. He stated that "NATO of the 1990s could find itself in a more precarious position than the Europe of 1914 or 1930." [19] General Rogers echoed these sentiments recently. He stated: "I personally believe that the day is coming when the Soviet Union is going to test us someplace--Northern Norway, Eastern Turkey, Hamburg or Berlin and just see what the reaction would be. I'm not sure that NATO as a body would react to that test." [20]

How can the erosion of the nuclear balance of power be turned around so that NATO has the capability to effectively deter Soviet aggression and defeat the enemy if need be? The nuclear balance of power in the European theater may be irreparably tipped in favor of the Soviet Union and the NATO allies must rely solely on their conventional forces to deter aggression. General Rogers stated the nations of Europe must increase their numbers and enhance the technologies available to NATO forces or negotiate with the Soviets to eliminate the actual cause of instability in the region--the conventional imbalance. [21] There have been numerous studies done on the best way to defend Europe in the future. However, any serious study must consider future fiscal constraints and the

willingness of the NATO nations to expand their capital outlays for defense. The solutions General Rogers and the NATO defense studies promote are all high technology and high cost solutions.

On 17 Sept 1987, General John Chain announced that plans to reduce the inventory of B-52s are being reviewed in light of the INF treaty and the conventional imbalance in Europe.[22] I contend that a force of long range bombers, updated with modern avionics and weapons, would significantly enhance the warfighting capability of the theater CINCs. Former Air Force Chief of Staff, General Curtis LeMay, recently stated in a Viewpoint article published in Aviation Week and Space Technology:

Building long range, all weather, day/night, non-nuclear stand off weapons and integrating them into existing bombers is a relatively easy task and all the technologies required are on the shelf. In my opinion, the biggest difficulty is making the decision to field these super smart weapons.[23]

The Report on Conventional Defense Improvements, approved by the NATO ministers, highlighted a critical requirement to improve the conventional defenses of Europe against attack by the Soviet Union.[24] This requirement is even more critical in light of the INF treaty and the potential for eventual denuclearization of NATO. With the budgetary constraints we face, our military planners should look to low cost alternatives such as enhancing our present weapons systems with available technologies rather than developing entirely new and more costly systems. Upgrading our B-52 force with present day technologies and dedicating this force to conventional operations has the potential to fill force shortfalls in a variety of mission and geographic areas and should be evaluated.

Chapter Two

POLICY, GUIDANCE, AND DOCTRINE

HISTORICAL BACKGROUND

Since the creation of the Strategic Air Command, the strategic bomber force has invariably been thought of solely as a nuclear weapons delivery vehicle. Outside of limited duty during the Korean and Vietnam Wars, the bomber force has been inexorably tied to its primary mission of providing support to the Single Integrated Operational Plan (SIOP) mission. Over the years, the B-52 force has made forays into support of theater commander requirements in the operational planning world only to have the support removed or altered due to force reductions, aircraft modifications to support its SIOP mission, or simply changing requirements. A conventional bomber force of 70 B-52Ds was to be the SAC conventional bomber force of the 1980s. However, in 1982 this force was retired due to fiscal restraints and the supportability problems of the aircraft. In the early 1980s, the Strategic Projection Force (SPF) was tasked to provide 35 bomber aircraft, as part of a stand alone strike force, to the Rapid Deployment Joint Task Force (RDJTF), the predecessor of USCENTCOM. This was to be a composite force made up of SAC assets to provide a stand alone, rapidly deployable, strategic force with air refueling, reconnaissance, and intelligence support. Due to proposed force structure reductions, introduction of the Air Launched Cruise Missile, and movement of B-52s to support B-1 basing requirements, the force structure of the SPF has been modified several times. Because of its nuclear deterrent role, SAC forces have historically required release by the National Command Authorities to support conventional requirements. Additionally they have faced the threat of recall if required to support the SIOP. These uncertainties over force structure and questions over whether or not the bomber force would be released by the National Command Authorities for actual conventional operations have resulted in theater commanders not planning on the availability of the bomber force and thus not providing support when difficult budgetary decisions must be made. Thomas Keaney points out in his monograph, *Strategic Bombers and Conventional Weapons*:

Even though nuclear deterrence and conventional war fighting are by no means incompatible, the concentration on the former since World War II has placed the bombers in a special category at the expense of the latter. Technical developments, strategic thought and operational control of the aircraft were, and still are, affected by this specialized perception of the role of the bomber. [25]

NATIONAL POLICY

While these variations in the SAC conventional force structure and availability of SAC conventional forces were disconcerting to the theater commander trying to plan his forces, they were in keeping with the national objectives. From the end of the Second World War to the present, the highest national military priority has been to deter nuclear war with the Soviets by maintaining a sufficient strategic nuclear strike force. General Welch points out in his Annual Report to the Congress: "Of all the threats to our national security, none is so potentially devastating as that of nuclear war. Therefore, the strategy and forces necessary to deter nuclear conflict will remain preeminent in our military structure." [26] From the days of Curtis LeMay to the early 1970s, this meant creating a massive strategic bomber force to be used solely in this role. In the late 1960s and early 1970s, it was realized that the concept of relying on the mutual devastation of two societies, and most likely the entire world, was a rigid and unworkable concept and needed to be readdressed. As a result, American policy shifted from "massive retaliation" to a doctrine of flexible response. This concept provided "a full continuum of graduated responses designed to limit destruction to the minimum needed for stopping an attack." [27] Sufficiency can be defined as the forces necessary to deter aggression in a flexible manner and no more. The primary strategy is still deterrence [28], but it is now achieved at all levels of potential conflict and in all theaters of operation through flexibility rather than massive retaliation.

These concepts drive fundamental force structure and doctrinal requirements. A force structure must contain a balance of forces adequate for each mission and must be flexible enough to respond to any contingency at any level of conflict. In keeping with these national objectives and guidance, the Department of Defense and the Air Force have had to rethink their force structure, missions, and doctrine. General Thomas White, former Air Force Chief of Staff, pointed out:

The Air Force is a national instrument and evolves no doctrine and makes no preparations other than those clearly and unmistakably called for or anticipated by the national policy. [29]

GUIDANCE

To support the doctrine of flexible response, a commander's forces must be developed to provide support across the spectrum of conflict, provide support to our sister services, and provide support to the armed forces of our allies. FY 1988-1992 Defense Guidance is very specific about the requirements of United States forces.

Rapidly deployable forces must be able to deploy quickly to areas of potential conflict, to deter aggression, reinforce forward deployed forces in the event of global conventional war and meet the demand of regional conflicts. [30]

Historically, the demands for a rapidly deployable and sustainable force have been met by the Tactical Air Forces. The TAF forces were responsible for theater conventional war while SAC maintained its commitment to its nuclear deterrent mission. However, the requirements of conventional wars and current guidance demand modification of this thinking. The current Defense Guidance is very explicit concerning Strategic Air Command requirements to provide support to conventional operations:

To facilitate response to ambiguous warning, conventional forces (including long range bombers) will be maintained at a high state of readiness through planning, training and exercises that emphasize deployment, sustainability and joint operations. [31]

Additionally, the Defense Guidance directs us to provide funds for improved conventional capabilities to support these missions. This includes the "development and acquisition of new and improved weapons." [32]

The guidance of the civilian leadership is in place and is very specific. Long range bomber aircraft have an important and integral role in theater warfare and SAC must develop its forces to support these requirements. Extra emphasis must be placed to support joint operations. JCS PUB 2 further emphasizes this fact where it repeatedly tasks the Air Force units to "develop, train and equip their forces" to support joint endeavors." [33]

DOCTRINE

There are several points that can be made concerning Basic Aerospace Doctrine. First and foremost, it is intentionally very broad and general in nature. AFM 1-1 outlines the "...most fundamental and enduring beliefs which describe the proper uses of aerospace forces in military action." [34] This is actually one of its strengths. It does not pigeon hole aircraft systems with a particular mission or area of responsibility. Historically, the

bomber force has been seen as the force of choice for "strategic targets" and targets requiring deep penetration of enemy defenses. Battlefield targets were to be left to the tactical forces. Vietnam changed this mode of thinking however, as B-52s were used in all mission areas to include close air support. In fact, the majority of the B-52 missions were flown against battlefield targets. [35] Basic Aerospace Doctrine does not identify one platform over another as preferable for a specific mission or target type but views the application of airpower as "... an indivisible entity based on objectives, threats and opportunities... and strategic and tactical actions are not tied to specific geographic areas, operating environment, or types of vehicles." [36] With the advent of satellite navigation capabilities, enhanced on-board systems, precision guided munitions, and advanced warhead and sensor design, this doctrine of the flexible application of airpower is truer now than ever before. This flexibility is the strength of Air Force doctrine.

Obviously our doctrine is not without shortfalls, particularly when we talk about new missions based on new capabilities. One significant problem when dealing with strategic assets are the command relationships which are involved. Range is the strength of the strategic bomber force. However, it creates a significant problem in the arena of command and control of the force. SAC forces could conceivably operate from sanctuaries in the United States to support multiple theater commander requirements. In the case of a European conflict they would most likely operate from East coast basing (i.e. Loring or Pease) until overcrowding of European bases is alleviated, logistics support is available, and air superiority is gained. From these sanctuary East coast bases the bomber could support multiple commanders and multiple commitments. For example, a B-52 operating from Loring could support SACEUR with a bombing mission over Germany, LANTCOM with a mining mission against the Greenland/Iceland/United Kingdom (GIUK) gap, or SOUTHCOM with a Sea Lane Control mission near the Panama Canal. Basic Aerospace Doctrine defines the theater Air Component Commander as the individual responsible for determining where aerospace assets are applied and how they are utilized. In the case of strategic bombers, an individual above the theater commander level needs to be responsible for determining allocation to each theater commander. The initial days of a conflict, when strategic assets may be most valuable, is not the time to be making the political decisions such as allocation of forces. Intertheater command relationships need to be identified prior to the beginning of conflict.

Another problem with our Aerospace Doctrine is that it does not provide any operational guidance on the actual application of our forces. This is the function of the Air Force -2 series manuals. These are designed to lay out "operational doctrine" which describes the "... proper use of aerospace forces in the context of distinct objective, capabilities, and broad mission

areas and operational environments." [37] This series of documents is designed to outline what has been called the "operational art of war" where the actual battlefield environment and application of forces is simulated. One of the strengths of this series of documents is that they are to take into account the technological changes of the time and thus should be continually updated. Unfortunately, these are in serious disrepair and many have not been updated in over 20 years. Additionally, there is no operational guidance developed to support SAC conventional bomber operations.

Chapter Three

AIRCRAFT CAPABILITIES

INTRODUCTION

The B-52 force was initially tasked and designed as a high altitude nuclear delivery vehicle whose primary mission was deep penetration of enemy territory to deliver nuclear gravity weapons. Enemy defensive capabilities soon made this tactic impractical and the low altitude terrain avoidance tactic was developed. The tactic has been enhanced over the years by modifications to the aircraft such as the addition of Terrain Avoidance Radar, Forward Looking Infra-Red (FLIR) television and a low light camera system. Flying at altitudes lower than 400 feet in adverse weather conditions, day or night, the aircraft utilizes terrain to mask itself from enemy radars. The development of the low level tactic and the aircraft's proven capability to perform a wide variety of missions makes it an extremely valuable resource in a theater conventional conflict. It is capable of performing missions that no other Air Force or Naval asset can effectively accomplish. This chapter will briefly describe the characteristics of the B-52 aircraft and relate some of the capabilities which, when applied to specific mission areas and geographical situations, should make it the weapon delivery platform of choice.

RANGE

There are presently two models of B-52 aircraft in the active Air Force inventory, the B-52G and the B-52H. Both aircraft possess intercontinental range. The G model with its J57-P engines has an unrefueled range of 7500 miles at high altitude cruise. The H model, the newer of the two aircraft models, has a more fuel efficient TF-33 turbofan engine and has the capability to fly 10000 miles unrefueled. [36] Extended low altitude operations would significantly reduce these ranges. However, history has shown that, with air refueling, the aircraft and the crews can endure the longest of operational missions. During BRIGHT STAR 82, 3 aircraft from Minot AFB and 3 from Grand Forks AFB (both in North Dakota) flew 15 hours to a simulated airfield at Wadi Naturn in Egypt, flew a 1 hour low level mission, released their loads of Mk-82 weapons on target within four seconds of their scheduled time over target (TOT), and returned to their home station. The 42-hour flight

required five air refuelings and was the longest bombing mission ever flown.

The aircraft has participated in other exercise and real world operations to demonstrate the power projection capabilities of the plane. In 1957, a B-52 flew an around the world mission of over 45 hours duration.[37] In the early eighties, operating out of Andersen AFB, Guam, B-52s were routinely flying 30 hour Sea Reconnaissance/Surveillance missions against Soviet ships in the Indian Ocean. These missions provide clear evidence of some of the capabilities which the range of the strategic bomber provides over other platforms in a wide variety of mission scenarios. The bomber force has a flexibility of action not available to other aircraft. In a scenario such as a Southwest Asian conflict, where host nation basing agreements have not been concluded, basing rights would have to be negotiated after a conflict began. Once regional basing is obtained, it could take days to establish a deployment flow and secure sea lines of communications to be able to provide sufficient forces to support such a regional contingency. Deployment times for Army, Navy and Tactical Air Forces would be a matter of days, assuming support of vital enroute intermediate staging bases. Strategic assets operating out of Diego Garcia in the Indian Ocean, or even the United States, could respond rapidly and may be the only platform available during the early stages of such a conflict. Even after all other forces are in place, it would still be the only system capable of conducting deep interdiction strike missions.

In the European theater, aircraft could easily operate from sanctuary basing in the United States and would not be required to stage from already overcrowded and vulnerable European bases. Bomber operations would not depend on the long, tenuous, and saturated logistics pipeline. With their range and loiter time, strategic bombers could fly missions from the states, remain on station for hours at high altitude until a critical moment in the land battle, and deliver their ordnance where and when the battlefield commander requires. Its Offensive Avionics System (OAS), a new digital state of the art bombing and navigation system, gives the bomber a more accurate weapons delivery capability and near perfect time control. The aircraft is capable of precisely delivering weapons where and when the commander needs them.

FLEXIBILITY

In his Annual Report to the Congress Casper Weinberger highlighted the capabilities of the bomber force:

The flexibility of the manned bomber force will continue to make it an essential element of the triad. Bombers can seek out and attack mobile targets; and be rearmed for subsequent missions. Armed with conventional

munitions. strategic bombers can project power to distant points on the globe. sometimes before the arrival of other conventional forces. They can also conduct surveillance. minelaying. and anti-ship warfare in support of general purpose naval forces.[38]

The B-52 possesses a combination of range. responsiveness. and payload capability which provides the operational flexibility to support multiple theater commanders in a variety of roles from a single operating location. This is a capability unique to the strategic bomber. Operating from Loring AFB. Maine a consolidated wing of strategic bombers could support SACEUR with interdiction missions in the Central region. CINCLANT with strategic mining operations against the Greenland/Iceland/UK (GIUK) gap. and others could support CINCSOUTH with sea lane control missions in the Panama Canal area. United States war plans tend to reflect operations being conducted in a single operational theater. However. these missions in adjacent theaters would have a significant impact on operations in Europe. Strategic bombers are the only aircraft that have this flexibility.

Another capability which the B-52 has is its ability to remain on station for extended periods of time. With air refueling. the aircraft could maintain its relative position to the battle for hours until its firepower is required. Additionally. the B-52 could. with minor aircraft modifications. carry a varied weapon load to provide the proper munitions and submunitions against specific targets.

PAYLOAD

Carl Berger in his book. USAF in Southeast Asia. notes that in the words of General Westmorland "the thing that broke their backs. . . was the tremendous tonnage of bombs dropped by the B-52s." [39] The B-52s which supported operations in Vietnam were primarily the "D" model. These were retired in 1982. It had a unique carriage capability due to an enlarged bomb bay. It could carry up to 108 general purpose (Mk 82 500 lb or M-117 750 lb) weapons. Neither the "G" model nor the "H" model has the expanded bomb bay. However. they still possess an impressive capability. They can carry up to 51 of the aforementioned weapons and reduced loads of heavier weapons (Figure 9). However. there are severe limitations to the weapons which the aircraft can carry. Most of the inventory approved for carriage are World War II vintage gravity weapons. The primary weapons approved for carriage are the Mk-82. M-117. and the Mk-84. Each of these are limited to the accuracy of the delivery vehicle and the ballistics of the weapon. SAC owns no "smart" or terminally guided conventional munitions. Additionally. as pointed out by George Kirby. Director of Long Range Armament Planning for Systems Command. the weapons are not capable of destroying hardened targets such as runways and hardened transport facilities.[40] Unfortunately. to destroy the capability

of opposing air forces and the enemies' ability to rapidly reinforce and support their forward forces, these are precisely the types of targets B-52s would be tasked against. The weapons would skip or break up on impact rendering them ineffective. General Robert D. Eaglet, former head of the USAF Armament Division, points out that we have failed to effectively apply the lessons of history to utilize the technology available in the development of weapons:

We can't afford to overlook the lessons of Vietnam where we delivered 800 sorties against the Than Hoa bridge without dropping it and we lost a dozen or so aircrews in the process. When we introduced Paveway I, we went up there with very few sorties and dropped it on the first try and lost nobody. [41]

The capabilities and effectiveness of the smart bomb has been readily apparent in every conflict since Vietnam. One only has to look at the Falklands War or the 1982 Israeli-Syrian War to see just how effective these weapons can be. However, with the exception of the HARPOON anti-ship missile, the remaining conventional weapons approved for carriage on the aircraft require overflight of the target and the enemies' terminal defenses. While in some scenarios overflight may be an acceptable tactic, penetration of heavily defended areas, as would be encountered in the Central European theater early in a conflict, is not a feasible concept of operations for the aircraft. Attrition would be excessive and the probability for mission success would be extremely low. Therefore, the weapons which the aircraft can currently carry put the aircraft at an unacceptable risk.

The one mission area where the appropriate weapons for delivery are being developed is support of US Navy operations. SAC and the Navy have expended a great deal of time and effort in identifying missions, support requirements, and hardware for support of their joint operations. In the early 1970s, the Air Force and Navy concluded a Memorandum of Agreement for SAC aircraft to train and exercise regularly in support of a Sea Reconnaissance and Surveillance (nicknamed BUSY OBSERVER) mission. The responsibilities were expanded to include sea lane control. In 1976, the Air Force selected the GBU-15 (a 2000 pound optically guided bomb) to support this mission and modified a total of ten aircraft for this mission. [42] These aircraft were retired, along with the capability in 1982. In 1986, SAC developed a capability to support the Navy with HARPOON launches. Two wings are now trained and equipped for this mission. Additionally, B-52s provide the Navy a greatly expanded mining capability. They can carry most of the mines in the Navy inventory, to include the new quickstrike series, the DST 36-500 pound mine for shallow harbors, the MK 55-2000 pound mine, and the new MK 60 CAPTOR anti-submarine deep water mine. This series of mines provides the capability to mine harbors, strategic outlets to the open sea, or major choke points in, or leading to, the sea lanes of communications. SAC aircraft can carry more weapons than either Navy ships or aircraft and are

far more responsive and effective in this role than naval assets. In addition, committing SAC aircraft to the mining role, would free already overcommitted Naval assets to their anti-submarine warfare and strike warfare missions.[43]

B-52s provide an enormous weapons carriage capability which is underutilized because of the limitations of the weapons they carry. The current inventory of World War II weapons put the aircraft and crews at an unacceptable risk. B-52s require a family of standoff weapons to enhance their effectiveness.

DEFENSIVE CAPABILITIES

The B-52 relies heavily on the low level, terrain avoidance tactic for its primary defense. Flying at low altitude under the cover of darkness, crews use terrain to avoid detection by enemy radars. The modification of the aircraft with FLIR and low light TV greatly improves this capability.[44] The aircraft also relies heavily on its non-lethal defensive measures. Both models have the phase VI ECM avionics package.[45] While it has an extremely capable ECM suite, there are holes in the coverage, particularly against recently fielded Soviet defensive radars. In addition to ECM, the aircraft carries both flare and chaff expendables. However, the aircraft has extremely limited lethal defensive countermeasures. The "G" has four 50 caliber, radar controlled, remotely operated guns in the tail, while the "H" has a 20mm cannon.[46] Both have a limited range, a small cone of fire, and an inability to discriminate between friendly and enemy forces. (Numerous times during exercises, particularly RED FLAG, the author has seen friendly forces stray to close and get "shot down" by the BUFF).

CONCLUSIONS

The B-52 is an extremely flexible weapon system which has unique capabilities. To be applied most effectively in a theater, it should utilize these capabilities and perform those tasks for which it is ideally and uniquely suited. However, there are numerous problems it must be addressed to enhance its utility in theater conventional conflicts.

Chapter Four

ENHANCED CAPABILITIES

INTRODUCTION

If the Air Force wants to enhance the conventional capabilities of the bomber force, a broad and comprehensive program must be initiated immediately. Programs which urgently need to be addressed cover the four broad and general categories of tactics and training, weapons, aircraft structure, and avionics. US News and World Report points out that "the battlefield of the future will integrate three technologies: Advanced sensors to precisely locate enemy units, weapons to strike them, and elaborate electronic command and control systems to coordinate the entire battle." [47] With a comprehensive program to upgrade each of these areas, the bomber force can develop into the most flexible and capable aviation asset this nation possesses. However, the time to make the decisions has arrived. General Curtis LeMay points out that the hardest thing the command has to do is to make the decision and commitment to start such a program. [48] Over the years, previous CINCs have given the conventional world lip service. When the difficult budgetary decisions were to be made, it took a back seat to the SIOP. I believe the command, under the leadership of General Chain, is ready to make such a commitment.

TACTICS AND TRAINING

Since taking over as CINCSAC, General John Chain has instituted numerous programs in support of conventional operations. He has expended a great deal of effort to expand the conventional capabilities of the command, sometimes at the expense of the command's nuclear commitment. He has developed new and dynamic programs to change the historical SAC nuclear mind set and improve the capability of the command to support theater requirements. He has directed every unit to train to support a secondary conventional Designed Operational Capability (DOC). Previously, only those units actually supporting theater commander Operational Plans trained to support such requirements. Others trained solely for their primary nuclear mission. Individuals, who previously had never been exposed to conventional operations and tactics, were now required to become intimately familiar with both. Additionally, the SAC Inspector General evaluates each unit's capability to perform this secondary DOC during his annual inspection.

This program has greatly expanded the knowledge base of both crewmembers and staff personnel and provided new and interesting responsibilities for the unit.

Another program General Chain initiated was the development of a conventional planning scenario for each unit. Under this program, crews and staff planners are brought to SAC Headquarters, given a representative target suitable for strategic assets, and directed to plan their own mission. They are directed by General Chain to "start with a clean sheet of paper" and not be encumbered with tactics or procedures of the past. They are told to get rid of the "Vietnam mentality" and be as creative as possible. This program is designed to provide planning expertise at the unit level, and develop new and innovative tactics through dynamic mission planning.[49] Crews are directed to develop mission packages in the event such a mission is required to be flown. Additionally, units are tasked to train to these new (and always extremely demanding) mission scenarios. From this program, new tactics have been developed for the command, new hardware developed and procured to support the requirements, and certification of weapons and equipment for carriage on the aircraft has been accelerated. Crews are now routinely training for tactics and tolerances previously never considered feasible for strategic aircraft.

Organizational changes within the headquarters have also been instituted to better support the new priorities. A new Directorate for Tactics (DOJ) has been created to meet the demands and increased emphasis on conventional tactics. Conventional plans and operations have been consolidated under one directorate to provide more effective coordination. The intelligence community is training unit intelligence officers in targeting and attrition so that units can shoulder more responsibility when they deploy. These functions were previously accomplished by SAC headquarters personnel. To support this capability, each unit is building Sensitive Compartmentalized Information Facilities (SCIFs). This is an extremely expensive proposition and demonstrates the commitment of the command.

Mobility is also receiving increased emphasis within the command. Previously, SAC units rarely deployed from home station. Many times European exercises were supported by units operating from the Conus. As was pointed out previously, we have even supported exercises in Southwest Asia from the Conus. This has all changed. Units now pick up and move on a no-notice basis at least twice a year, with the intent of operating from austere, bare basing. SAC has practiced this by sending crews and their support to primitive bases with supplies for 30 days.[50] The command and the units have learned many valuable lessons which would never be learned but for this realistic approach. However, the command can only accomplish so much with innovative tactics and training. The equipment which the crews work with, to include the weapons they must deliver, must be updated to achieve maximum effectiveness.

WEAPONS

Weapons now available or in advanced development could significantly boost the West's ability to attack Warsaw Pact targets behind the front. This is a key element of the combat plan known as Follow-on Forces Attack (FOFA). NATO endorsed the strategy in 1984.[51]

As was pointed out earlier, with the exception of the HARPOON missile, the conventional weapons certified for carriage on the B-52 are gravity weapons. These weapons require overflight of the target, are limited to the accuracy of the delivery vehicle, and are limited in the types of target types they are effective against. While these weapons may be effective against soft, lightly defended area targets, they are generally unsuitable against the types of targets the aircraft would be targeted against. We cannot fight a war in the 1990s with antiquated technologies and equipment. A comprehensive program to upgrade the SAC weapons inventory must be initiated. SAC should review the target structure and determine, in conjunction with the theater commander, which targets would be most suitable for SAC assets. General Chain has proposed that SAC should "go deep".[52] This is the right approach. SAC should identify those missions which, due to its range, payload, and unique capabilities, it can perform more effectively than other weapons systems. Based on these considerations, a "family of weapons" should be developed. This family would include improved gravity weapons, mines (both land and sea), and stand-off weapons. Additionally, SAC should determine the feasibility of acquiring lethal defensive weapons to increase the ability of the aircraft to reach its targets. SAC has numerous options in the types of weapons which should be considered for development. These are either presently available or could be available in the near future based on present technologies. This is the approach the command should take to minimize both cost and technological risk.

Improved Gravity Weapons

There are many situations where gravity weapons may be most appropriate. Against soft area targets, in lightly defended areas, where overflight of target complexes will not significantly increase attrition or reduce target coverage, they may be the weapons of choice. Additionally, they are the lowest cost alternative. However, these weapons must be improved to enhance their effectiveness against a variety of hard targets such as airfields and transportation nets. A program called "Have Void" was designed to upgrade a portion of the conventional gravity weapons inventory through strengthening the case and improving the fuse of the Mk 84 2000 pound bomb.[53] These modifications were to ensure the weapons would not break or skip on impact and would penetrate hard targets such as runways for better destructive capability. B-52s are certified to carry the Mk 84 munition as

well as a wide variety of other gravity weapons. Each of these munitions should be upgraded to provide this hard target kill capability. It is estimated that the destructive power of munitions could be doubled by this simple and relatively inexpensive modification.[54]

Sea Mines

Control of the sea lines of communication (SLOCs) is critical to the successful conduct of a European conflict. As a previous CINCLANT pointed out, "the success of the entire NATO strategy of forward defense of Europe is heavily dependent on reinforcement and resupply. Without shipping, SACEUR could not sustain the fighting in Western Europe for more than ten days."[55] (In the article Admiral McDonald gives an excellent outline of the tasks and the concept of operations envisioned to secure the sea lanes.) The magnitude of the support required is enormous. "In a conflict of even moderate size, it would be necessary to reinforce the allied armies by some one million men, provide some four million tons of equipment, and four and a half million tons of ammunition and a hundred million barrels of oil."[56]

Fully 90 percent of the men and equipment required for the resupply of NATO would arrive on ships from the United States. If the SLOCs are not secure, delays, and the loss of men and equipment would result.

Mining is one mission area SAC can perform far better than any other Air Force or Naval asset and it provides a significant return on investment. Its carriage capability, coupled with its range, gives the B-52 the capability to rapidly mine strategic sea lanes such as the GIUK GAP, enemy harbors like those around the Kola Peninsula, and critical outlets to the open ocean such as the Baltic Straits. Naval assets are presently about 50 percent of those required to perform the mining mission.[57]

Bombers can carry an extremely large mine payload when compared with other delivery vehicles. To improve this capability, SAC must work with the Navy to give mining the priority it deserves. One program designed to provide a low cost fix is the conversion of bombs to mines. This is a relatively simple conversion which is greatly expanding SAC's ability to support mining requirements. Under this program (termed Quickstrike) bomb bodies, such as the Mk-82, 500 pound bomb, are converted to a mine by making the body water tight and changing the fuzing. Quickstrike mines have common target detection and classification mechanisms and are utilized for shallow water deployment.[58] This could conceivably be done to any conventional bomb, thus greatly expanding the inventory of mines and our capability. Shallow water mines do not need a great deal of sophistication in order to be effective as the Iranians have proved in the Persian Gulf.

One type of Naval mine which would provide a quantum leap in our capability to mine deep water strategic choke points is the CAPTOR (Encapsulated Torpedo) mine. This mine utilizes both active and passive sensors to identify submarines as either friendly or enemy and, once detected, can launch a Mk 46 homing torpedo.[59] The capabilities of the system are remarkable. The system would be used to mine the strategic entrances to the Atlantic shipping lanes, and, when coupled with the HARPOON capability of the B-52, would provide great support to the Navy's sea lane control mission. Due primarily to funding constraints and the low priority mine warfare has suffered through in recent years, limited numbers of CAPTOR mines have been produced to date.

Land Mines

Another area SAC has "dabbled" in recent years, but where real opportunities for force enhancement are available, is in the area of the delivery of land mines. The mines of today are vastly different than what we normally think of. There are "smart" mines available or in development which precisely locate advancing forces, classifies them, and launches its projectile at the advancing forces.[60] The advantages of such systems should be obvious.

Mines are cheap and cost-effective weapons: they can render a soldier ineffective while lowering the morale of his comrades and tying down other personnel. They can destroy a tank worth hundreds or thousands of times more than the mine itself.[61]

The FASCAM series of scatterable mines, including the jointly developed CBU-89, GATOR mine, are designed to be delivered from fixed wing aircraft to rapidly create a minefield against advancing armor and personnel.[62] The Air Force is the lead service in the program and SAC should fully support the program and establish the capability to release both these weapons and follow-on mines. One such follow on mine is the Extended Range Anti-armor Munition (ERAM). When used in conjunction with the GATOR, it counters armored vehicles attempting to clear minefields and also contains anti-personnel mines to prevent mine sweeping operations.[63] The utility of mines in the European theater should be obvious. They will be used to slow down a Soviet offensive, destroy his men and machines, and allow the allied commander to shape the battlefield. However, this is not where the weapon coupled with the B-52 should be used. Other aircraft and ground forces are capable of performing this mission. The capabilities of the aircraft would be wasted. It should be used in scenarios such as the Southwest Asian theater to slow and counter a Soviet advance in areas where B-52s would be the only system available to sow mines in the critical, narrow passes of Iran, Pakistan, Iraq, etc. The "Buff" is the only aircraft with the range to do the mission, and the Army would be in no position to accomplish the task. B-52s could effectively slow down or counter Soviet advances by closing the passes until American ground forces could be brought to bear.

Stand Off Air to Surface Missiles

"The wide diversity of military threats facing the US on a global scale requires the Air Force to procure a mix of quality air-to-surface munitions to achieve our theater objectives." [64] This guidance is especially true for the Strategic Air Command considering the types of targets the aircraft might be targeted against. To support the theater commander, a "family of weapons" should be developed for B-52 carriage with a diversity of range capabilities, payloads, and warhead characteristics. SAC should avoid, if at all possible, the expense of developing unique weapons for carriage on the "Buff". They should instead provide support of joint programs, and ensure interoperability with TAC, Army, and US Navy programs. The present doctrine for Europe is based on THE AIRLAND BATTLE, where major support would be provided in the attack of follow on forces of the second and third echelon. B-52s, armed with a family of stand-off weapons, are well suited for this mission due to their unique range and flexibility and the aircraft's ability to fly at night and adverse weather.

One target structure bombers might be targeted against would be critical fixed transportation nodes (bridges, railways, etc.) used by advancing forces.

Tacticians anticipate using B-52s to launch as many as 20 long range cruise missiles each that can navigate by themselves, for example, to a chosen rail line. The weapon flies along the line dropping mines and attacks the next passing train. [65]

These choke points could be attacked early in the conflict by using conventional cruise missiles against predetermined target complexes. These targets could be "prefragged" so that cruise missile terrain matching and terminal guidance could be used and preplanned. The weapons could be fragged against enemy airfields and, after it is done dispensing its munitions, could fly over the target to evaluate its strike. While the cost of such missiles is high, they would be important in the early stages of a war to slow down second echelon forces before they can be brought to bear. Robert R. Bowie, Deputy Director for National Intelligence at the CIA, points out that such weapons would "frustrate the rapid movement implicit in Soviet Doctrine and... offer the possibility of very rapid creation of choke points." [66]

This technology is presently available and proven. SAC pursued such a weapon in the early 1980s, when it evaluated the concept of MRASM (Medium Range Air to Surface Missile). The command presently maintains in its arsenal a nuclear derivative of just such a weapon. All that would be required is the commitment. Quantities should be developed to support this early war requirement against very high priority fixed targets.

A missile, such as MRASM, might require a "SAC only" program because of its unique requirements and characteristics. However, other stand-off weapons with reduced range and capabilities should be pursued. The Air Force, and TAC in particular, has been studying and developing stand-off weapons for years. Many different types of weapons have been developed and evaluated. These include the GBU-15 and its follow-on version the AGM-130, JTACMS, the Standoff Attack Weapon (SAW), HARM, SLAM, and many others. The list of submunitions is also extensive. The important point is each weapon, when tied to a particular submunition, has unique characteristics and capabilities in terms of range, sensors, targeting, weight, aircraft position at release, and cost. The right mix of these, coupled with the correct submunitions based on projected targeting, would be a cost effective method to greatly enhance our conventional capabilities.

One interesting alternative is projected to be available in the mid 1990s. The modular standoff weapons concept is being studied by the armament directors of NATO. Under this program, a single family of weapons could be developed with interchangeable parts offering various ranges, guidance systems, and submunitions.[67] This would be a low cost, highly flexible alternative to the way we develop and deploy weapons presently.

Lethal Defensive Weapons

The B-52 would be greatly enhanced as a weapon system if it possessed an active defensive weapon. The terrain avoidance tactic is used to penetrate defenses. However, the terminal defenses and the advent of a Soviet look down/shoot down (Figure 10) capability increases bomber risk. General Chain recently unveiled a program called TACIT RAINBOW. An AGM-136A would be launched from the aircraft against enemy radars. The missile would have a range of 25 to 100 miles and would precede a bomber strike. It would be designed to fly and remain over enemy SAM sites waiting for their radars to start emitting and then attack the radar. The system is designed to help the aircraft penetrate enemy terminal defenses and would be a complement to HARM. TACIT RAINBOW could also be launched as part of a combined strike in support of fighters or attack helicopters.[68] A minimum air to air capability would also increase the aircraft's ability to penetrate enemy territory.

AIRCRAFT STRUCTURE

There are three programs that should be considered for the conventional force: the expansion of the bomb bay similar to that of the "D" model, procuring the Common Strategic Rotary Launcher for the conventional force, and the completion of Mil-Standard 1760 for the conventional force.

Bomb Bay Expansion

In the B-52D, the expanded bomb bay increased the weapons carriage of Mk-82s from 51 to 108 weapons. A similar expansion in the aircraft of the SAC conventional force would increase their capability both with gravity weapons and most likely with conventional stand-off weapons. There are trade offs to be considered (i.e. range). However, it would greatly increase the firepower capability of the B-52.

Common Strategic Rotary Launcher

The launcher is being procured for internal carriage of nuclear missiles. The support of internal carriage of advanced conventional weapons with extensive monitor, control, and environmental support, could be supported with the CSRL.[69] It might provide the capability to vary weapons and payloads internally giving enhanced flexibility and capability to the system.

Mill Standard 1760

Mill Standard 1760 will most likely be required to interface with new technology weapons to provide a common electronic interface between new weapons and the aircraft carrying them. A preliminary evaluation determined the impact of the modification to existing electronics would be minimal.[70] This modification should be accomplished on conventional designated bombers to ensure compatibility with the new generation of weapons.

AVIONICS

Two areas which would greatly enhance the weapons delivery capabilities of the aircraft are the integration of the Global Positioning System (GPS) into the present bombing and navigation system and the development of advanced on-board sensors for the new generation of weapons.

Global Positioning System

While the B-52 just received an updated bombing and navigation system, the GPS would improve aircraft accuracy and make it more effective to the theater commander in several mission areas. In mining, for example, precise readback of "splash points" could be obtained. This would improve the monitoring of the field and, after hostilities have ceased, aid in the neutralization of the minefield. Additionally, safe passage routes could be developed through which friendly shipping could transit. On the battlefield, more precise targeting would be provided and a common "language" of coordinates would be available.

Sensors

The details of sensor technology are far too detailed and complex to be discussed in this paper. Suffice to say that updated sensors would provide the B-52 the capability to identify and classify potential targets. One area where this would increase capabilities is in the sea control mission where critical AWACS resources presently provide targeting information to mission aircraft.[71] New sensors on these aircraft could free the AWACS for their battlefield role. Another sensor could provide targeting information on a moving column of tanks for attack. Different types of sensors include the millimeter wave radar which would eradicate false targets and jamming.[72] Additionally, there are other more mature technologies such as Infra-red, Synthetic Aperture Radar (SAR), Inverse Synthetic Aperture Radar (ISAR), and Moving Target Indicators. The decision would have to be made which systems to use based on operational requirements.

COMMAND AND CONTROL

Boeing is developing an EC-18 Joint Surveillance and Target Acquisition Radar System (JSTARS) for the command and control and targeting in the European theater.[73] SAC must ensure interoperability with the system.

CONCLUSION

In this chapter, some enhancements for a conventional bomber force to improve the aircraft's ability to work in the conventional arena have been outlined. There are numerous problems and opportunities which have been overlooked. If the military is serious concerning enhancing SAC support to conventional warfighting and it must spend the money necessary to develop a viable capability.

Chapter Five

SCENARIO AND APPLICATION

SCENARIO

The date is 29 December 1993. The world is in turmoil. There are riots in the Panama Canal Zone over continued American presence in the region. While government forces have, with American support, suppressed the disturbances, the use of excessive force has increased the tension in the region. There is evidence that the dissidents are being armed by Soviet surrogates in the region. In Korea, the assassination of President Kim, the mobilization of North Korean forces, and the increased calls by the North Korean press for reunification of the two nations have caused tensions to mount between the two countries. In Iran, the political and military situation is in total disarray. The death of Ayatollah Khomeini in 1991, and the termination of the Iran-Iraq war that same year, resulted in serious internal divisions within Iran. The takeover by the moderates of the nation resulted, initially, in a government not unfriendly to interests of the United States and the West in general. However, internal opposition by the fundamentalist clerics of the nation presented a situation similar to that of 1979. Fueling the situation is a successful revolution of the people of Northwest Iran. There, Kurdish revolutionaries have broken away from the ruling government and established their own independent nation of Kurdistan with a capital in Rizaiyah. The ruling government of Iran has been unable to effectively control the peoples of the region primarily due to the unrest which the fundamentalists have created in Tehran. The stated goal of the moderate government is to reunite the country and the government is conducting military operations to put down the revolution. The ruling party of Kurdistan has asked for support from the Soviet Union and cite a post-World War II treaty between Russia and Iran to legitimize this request. The Soviets have responded by sending advisors to the newly created nation. The discovery of extensive minefields in the Persian Gulf and Red Sea has disrupted the flow of oil to the nations of Europe. The mines discovered were of rudimentary Soviet design. However, the Soviets have continually denied responsibility. This situation has heightened tensions between NATO and the Soviets and the Soviets have cut off the flow of natural gas through the European pipeline until a formal apology is received.

In the wake of these heightened political tensions, the Soviets have increased their military preparedness. They have used the Christmas holidays to institute a massive build-up of their ground forces along the borders between NATO and the Warsaw Pact. This was done under the guise of a military exercise. However, their military forces are at unprecedented levels for peacetime. Not since World War II have Soviet military forces along the Iron Curtain been at such levels. Additionally, their build-up of forces has not been limited to the ground forces in the theater. Their naval forces in the region of the Kola Peninsula and the Kamchatka Peninsula have heightened their preparedness with increased "at sea" rates. The build-up of forces in the Soviet Far Eastern Military District has resulted in Japan declaring her neutrality and requesting that the United States remove its forces from the nation. Japan has heretofore been unaffected by the situation in the Middle East and has actually profited by the ready availability of oil and natural gas which has been diverted by the Soviets and the Persian Gulf states from Europe. The United States has responded by initiating the movement of forces from Japan to the Korean Peninsula to reinforce that nation.

The United States and NATO have responded by mobilizing their forces and reinforcing Europe. Tactical fighter forces have been deployed to European bases and ground forces have been reinforced by a call up of the reserves. These forces are ready to be deployed along with their equipment to Europe and Southwest Asia and will be moved as soon as sufficient sealift becomes available and trade routes are secured. The Strategic Conventional Force (SCF), a force of 100 conventionally configured B-52G bombers, has been repositioned with 15 bombers at Diego Garcia in the Indian Ocean, 10 bombers at Andersen AFB, Guam and the remaining 75 aircraft being divided between the East Coast SAC bases of Pease and Loring. Requests by the United States for basing and staging rights to the moderate Arab Nations of Southwest Asia have been denied. Iran has requested military assistance in the event the Soviets send combat forces to the region to assist the Kurdistanian rebels. However, they have been unwilling to provide basing rights until they actually encounter Soviet forces so that they will not further offend dissenting factions within the country and the region.

Intelligence estimates predict that the Soviets are definitely preparing for a two-front war with their primary objectives being the destruction of the NATO forces and subsequent occupation of Europe. Additionally, their forces will attempt to establish military control over the Southwest Asian region and control of the oil fields to bring the economic infrastructure of the West to a halt. The Defense Intelligence Agency believes that the Soviets will be ready to mount such an attack in seven days.

APPLICATION

D-Day Minus 7

With a week left to prepare for a potential conflict with the Soviet Union, the SCF was tasked in a variety of roles before actual conflict began. Both CINCPAC and CINCLANT made requests, through the JCS, for support in their attempt to secure the sea lanes. They requested support through sea surveillance/reconnaissance missions. These could lead to sea control missions if the situation deteriorated further. The satellites and reconnaissance aircraft (AWACS and RC-135s) which could be assisting in this mission were diverted to support European and Southwest Asian theater requirements and were unavailable for support of this requirement. Aircraft from Diego Garcia were tasked with tracking a Soviet Carrier Battle Group in the Western Pacific as it passed around the Horn of Africa. Aircraft from Loring were tasked with a similar mission in the North Atlantic. They monitored ships departing the area of the Kola Peninsula. Each mission was designed to track the deployment of the ships and determine the magnitude of the effort. This intelligence is critical to support the total war effort. If these forces are allowed to gain control of the Atlantic, they would impede the reinforcement and resupply of forces in Europe and Southwest Asia and deny the use of the Azores as an intermediate stop on the deployment routes. Since Reconnaissance/Surveillance is a peacetime mission, no HARPOONS were loaded on the aircraft and they were armed with only self-defense weapons. However, both Loring and Andersen were told to begin preparations to support offensive sea lane control requirements. At each base Harpoon missiles were loaded onto aircraft sitting alert and crews were prepared to fly the mission in a few hours time. Ten aircraft at Loring and five at Andersen were equipped with the missiles to provide an initial response capability. The five remaining aircraft at Andersen were loaded with a variety of weapons to include general purpose munitions and GATOR mines for use on the Korean Peninsula.

D-Day Minus 3

Strategic aircraft, along with P-3s from the Navy, identified a significant threat to the Atlantic shipping lanes. A large Carrier Battle Group had transited around the Horn of Africa and was handed off to, and was being tracked by, the B-52s out of Pease. A significant increase in the number of both attack and strategic submarines has been identified by the P-3s. CINCLANT requested and received approval for defensive strategic mining operations to secure the Atlantic. The game plan was to covertly mine the Greenland-Iceland-UK gap and the Spitzbergen-Norway gap to impede and destroy Soviet ships operating from Northern Russia once hostilities began. Carrier borne assets and B-52s with HARPOON missiles would be used to impede the progress of the Soviet forces in the South. A total of 65 B-52s from Pease and Loring were loaded with 26 enhanced CAPTOR mines each. The aircraft flew around the clock at low altitudes to avoid detection. The mines

were in the inert configuration and were only activated by P-3s or by a satellite after hostilities were initiated. If the negotiations which were being conducted had succeeded, a signal from P-3s would have scuttled the mines and rendered them inert. During the next two days the initial minefields were in place and over 2200 mines in position in the critical choke points. B-52s carried the bulk of the effort with Naval subs and carrier based resources contributed to the total mission. A limited B-52 operation continued until hostilities began so as to provide a more formidable barrier and still allow the SAC aircraft to prepare for the impending conflict.

D-Day Minus 1

Hostilities in the European theater were imminent. A portion of the SCF force was kept in airborne alert status for rapid response. They maintained a position just west of France in the vicinity of an American carrier task force for defensive purposes. Each aircraft was configured with 20 short range anti-tank missiles carried externally. Each missile contained 40 Skeet warheads capable of destroying advancing enemy tanks. Internally, each aircraft carried 16 Medium Range Air to Surface Missiles (MRASMs), positioned on two rotary launchers. These missiles were targeted against the highest priority target systems--strategic choke points, command and control facilities, headquarters facilities, critical transportation nodes, and important airfields. Ten aircraft were kept airborne at all times in position to help slow down the initial attack by forces of the Warsaw Pact. Once notified, these forces could launch their MRASMs, within one hour of notification, against preidentified targets. Shortly thereafter, the aircraft, with positional guidance from the ground force commander using GPS references, would launch their anti-tank missiles against the leading edge of advancing forces.

In the Pacific, B-52s on Guam were loaded with either general purpose weapons to attack the critical transportation nets just north of the DMZ or with GATOR mines to mine the mountain passes leading to the south to slow down the advance of the North's forces. Once directed, aircraft could be on station within eight hours. The aircraft could launch against their prepackaged targets and be diverted to targets designated by the battlefield commander. On Diego Garcia, aircrews were prepared to drop mines against the high passes and use precision guided short range munitions against bridges in the isolated mountain passes of Iran which advancing Soviet forces would be forced to use. Mining and destroying these choke points could slow the Soviet advance until US Army/Marine troops and TAC fighters could respond.

D-Day

The initial attack was at 0500L Bonn time. The offensive was initially directed against two fronts in Europe as well as attacks in Iran and Korea. The primary thrust of the Warsaw Pact force was conducted by forces of the Western TVD against NATO's Central European defenses. A minor force was directed toward the Southern Flanks of NATO, toward Greece, by forces of the Southwestern TVD. It was a massive and well coordinated attack with Pact Air Forces attacking high priority airfields, command centers, and headquarters while ground forces, spearheaded by armored divisions, moved rapidly westward. There were reports of SPETSNAZ forces being airdropped near nuclear weapons storage areas, but this was not immediately confirmed. Simultaneously, in the Southern district, a initial cadre of Soviet troops were airlifted into Tabriz Airport along with a small force of Soviet fighters. A larger mechanized force was being deployed through the mountain passes of the Caucasus with a portion of the force diverted toward Eastern Turkey. Their objective was to join up with the forces already in Tabriz then expand and gain control of the central lowlands and ultimately the oil fields of the entire region. As soon as these forces were detected, a request went out from the government of Iran to the United States for military assistance. Basing rights were obtained from countries throughout the Persian Gulf and CENTCOM initiated the deployment of forces. Unfortunately, it would be two days before ground forces could be airdropped or fighters would be able to respond.

At the same time, North Korean forces were detected passing through the Demilitarized Zone (DMZ) toward the South. These were met by stiff opposition from Republic of Korea (ROK) forces. However, additional forces were being massed just north of the DMZ to reinforce the initial invasion force.

In every theater of operation, the B-52s were critical in slowing down and ultimately bringing to a halt the initial thrust of the offensive forces. In Iran, the B-52s flew under the cover of darkness through the high mountains to deliver GATOR mines and slow down the advancing mechanized forces--essentially closing the passes to travel. Every aircraft could deliver thousands of these mines capable of identifying and destroying armored vehicles and throwing advancing forces into disarray. Anti-personnel mines were also included in the package, enhancing the psychological effect and physical destructiveness of the package and tying up additional Soviet personnel with evacuation of wounded. Every time a mine destroyed a vehicle, the column would have to stop and move it from the single lane mountain passes before they could proceed. With very few roads through the mountain passes of Iran capable of supporting such a deployment, the aircraft were extremely effective

in their mission. Where able, bridges were destroyed by short range precision guided munitions. This tactic essentially closed routes for weeks. Ground forces and tactical air forces would not be available for days, but the B-52s coupled with Iranian forces had essentially tied the Soviet forces down in the mountain passes until additional US forces became available.

In the Pacific, the aircraft were airborne from Guam with their preplanned targets within three hours. As they entered their time control boxes, a divert message was received retargeting the bombers to higher priority targets based on the evolving battlefield. A large force package consisting of "Buffs" and tactical fighters was assigned to attack second echelon forces massing at Pyongyang airfield. While the F-15s provided tactical air superiority against the inferior North Korean air forces, F-4Gs and EF-111s suppressed the enemy's ground defenses, F-111s attacked airfields with Durandals, and the B-52s attacked the POL facilities with their general purpose gravity weapons. GATOR and CBU-89 mines were also dropped on the airfield to suppress enemy capabilities to reinforce their lead elements. While the Durandals cratered the runways, the FASCAM mines made it impossible for North Korean personnel to repair the runway or put out the fires in the POL facilities. This combined force package made reinforcement of the forward echelon of troops impossible.

In Europe, the theater commander felt confident that he could overcome the initial thrust of the numerically superior Warsaw Pact forces with his forces in place. However, defeat of the enemy would depend on slowing down the thrust of the second echelon forces until reinforcements could be moved from the states. The initial attack by the Pact air forces had resulted in destruction of 25 percent of the NATO air forces in Germany while they were on the ground and the crippling of the primary command and control structure in the region. The retaliatory strike by the forces that were able to get airborne proved to be devastating to the air forces of the Pact. Equally devastating were the strikes by those B-52s that had been on airborne alert at the time of the attack. The ten aircraft were, within one hour, able to launch 160 pretargeted MRASMs. These flew to their targets using terminal guidance and struck with precision accuracy. One hour later, these 10 aircraft, at the direction of the Air Commander, launched 8000 anti-tank submunitions against the leading edge of the invasion force. Precision accuracy was possible because the ground force commanders requesting the strike were using the Global Positioning System to feed target coordinates to the strike aircraft. About the same time these weapons were hitting their targets, 50 additional B-52 sorties were being generated and launched. These sorties carried anti-personnel and anti-armor submunitions destined for the second echelon. In the first 24 hours, B-52s had flown 60

missions to Europe carrying vast quantities of munitions designed to slow advancing armored forces, destroy high priority static targets, and cripple the advance of the second echelon. An additional ten aircraft were dedicated to CINCLANT to assist in securing the SLOCs. The CAPTOR mines in the strategic gaps coupled with the Northern Atlantic CVG and friendly attack submarines were capable of securing the Northern entrances to the Atlantic. However, the Soviet carrier task force that was known to be in the South Atlantic was a very real threat. Intelligence from satellites, B-52s, and friendly shipping had kept the position of the force updated. Based on this information, ten B-52s from Loring launched on an 18-hour mission with 20 HARPOON missiles each. The B-52s were to descend to low level altitudes when they were 600nm from the projected position and flare out around the perimeter of the CVG. Each aircraft would reach its firing position at 100nm from the target and launch all their missiles at once to confuse the enemy and overwhelm his defenses. The actual target was not the carrier which, at the center of the formation would be extremely difficult to attack. Destruction or crippling of the support ships would have the same effect. Under cover of darkness, at extremely low altitude, and running totally silent, the B-52s were able to successfully launch their missiles and return to home station. Intelligence estimates revealed a crippled and ineffective task force unable to accomplish its mission. The result for the allies was freedom to operate in the North Atlantic and the ability to resupply NATO forces with men and equipment.

D-Day Plus 2 thru 10

After two days of combat, American forces were able to achieve some degree of air superiority in all theaters. In Korea, the Combined Forces were able to blunt the initial ground attack and drive the North Koreans back across the DMZ. American air forces were able to decimate the Korean Air Force through combined force air strikes. The B-52s were diverted to mining missions off the coast of North Korea. Quickstrike shallow water mines were used to totally seal up eighteen North Korean harbors in only three days time. With sufficient air power to control the situation, the B-52s were diverted to Oman in the Southwest Asian theater on day six. In Southwest Asia, Soviet forces caught in the passes were unable to move forward to relieve forces in the Tabriz area. On day four, American fighter aircraft, fighter bombers, and ground forces were introduced into the theater to assist the Iranians and other friendly forces of the region in fighting the Russians. Soviet ground forces trapped in the passes were easy prey for both American forces and Iranian freedom fighters. With F-15s, tied to AWACS aircraft and RC-135s, providing cover, F-111s and B-52s concentrated on attacking enemy airfields and troop concentrations. Two bombers supported each missions by launching twenty TACIT

RAINBOW drones each over the target areas. As the enemy turned their radars on to track the attacking force, the missiles would attack the SAM or ZSU site rendering radar guided defenses useless. Under cover of darkness this was an extremely effective tactic. Delivery of combined effects munitions, Durandals, and FASCAM mines resulted in neutralization of enemy forces. B-52s stationed in Oman and Diego Garcia, and F-111s in Saudi Arabia were the only weapon systems capable of supporting the missions due to the distances involved.

In the European theater, the air war was going well. While total air superiority could never be achieved, the initial strike by B-52s against Command/Control and Communications facilities rendered the Soviet ground and air forces ineffective. When the highly structured and centralized command and control structure of the Soviets (which relied so heavily on effective communications) was destroyed, the Soviet forces (both ground and air) were in total disarray. Effective, coordinated, combined strike packages brought the war to the forward area of the Warsaw Pact by attacking the second and third echelons of the advancing forces. The tactics were similar to those used in Iran. The major difference was the magnitude of the effort and the use of hundreds of TACIT RAINBOW missiles. It proved to be an effective tactic which either destroyed the enemy defensive system or made him revert to ineffective optical modes. In the strike packages, F-111s with Durandals were targeted against airfields, and F-16s attacked support facilities, while the B-52s went deeper to destroy transportation nets and forces on the move. The combined forces provided the benefits of mutual suppression of enemy defenses and the ability to carry many different types of munitions for different target systems. They could attack the different enemy echelons to render each less effective. This provided a significant increase in effectiveness than would have been achieved by individual weapon systems. On the night of D-Day Plus 10, the B-52 force was tasked to bring the war to the motherland. A force of forty aircraft from Loring using conventional stand off weapons were tasked to attack the port city of Murmansk on the Kola Peninsula. The task was to bring the North Fleet to its knees and ensure freedom of the sea in the Atlantic and allow the Navy freedom of action to operate against north coast facilities. Only the Buffs have the range and the firepower to carry out the mission.

CONCLUSION

This paper was designed to demonstrate the capabilities of strategic aircraft to assist in defeating conventional Soviet forces in what might be considered a representative scenario. The B-52 is not the only solution. A significant improvement in all

conventional defense is required before this nation has a conventional force capable of deterring Soviet aggression. An upgraded, dedicated conventional bomber force with its range, payload, and flexibility should be a part of the conventional defense of NATO in the 90s.

Chapter Six

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

There exists a significant imbalance of conventional forces between the forces of NATO and the Warsaw Pact. The removal of Intermediate Range Nuclear Missiles creates a situation where NATO must rely on its conventional defenses to deter attack from the Warsaw Pact. In order to provide an effective deterrent, NATO's conventional force structure must be enhanced. We have already seen the beginning of what appears to be reduced funding levels in the United States military for the next few years. In light of this, low cost alternatives must be developed to meet the challenge in Europe. One alternative which should be considered is the development of a conventional force of B-52s dedicated to meeting theater requirements. We must make the decision now to create the best conventional force possible and strategic aircraft should be an integral part of this force.

RECOMMENDATIONS

1. Identify force level requirements necessary to provide an effective force of bombers to meet theater commander requirements.
2. Dedicate this force to conventional operations.
3. Modify the force with weapon system enhancements that will make it effective and survivable in all theaters of operation.
4. Identify those missions which strategic aircraft can perform more effectively due to its range, payload, and flexibility than other weapons systems and target support requirements to meet these missions.
5. Update basic Air Force doctrine and operational doctrine to reflect these modifications to force structure and missions.
6. Train and exercise this force in combined and joint operations so that Theater Commanders and Air Component Commanders are familiar with the unique capabilities of the aircraft and will be better able to integrate strategic aircraft into the total war effort.
7. Update command relationships and apportionment procedures to ensure B-52s can be most effectively employed.

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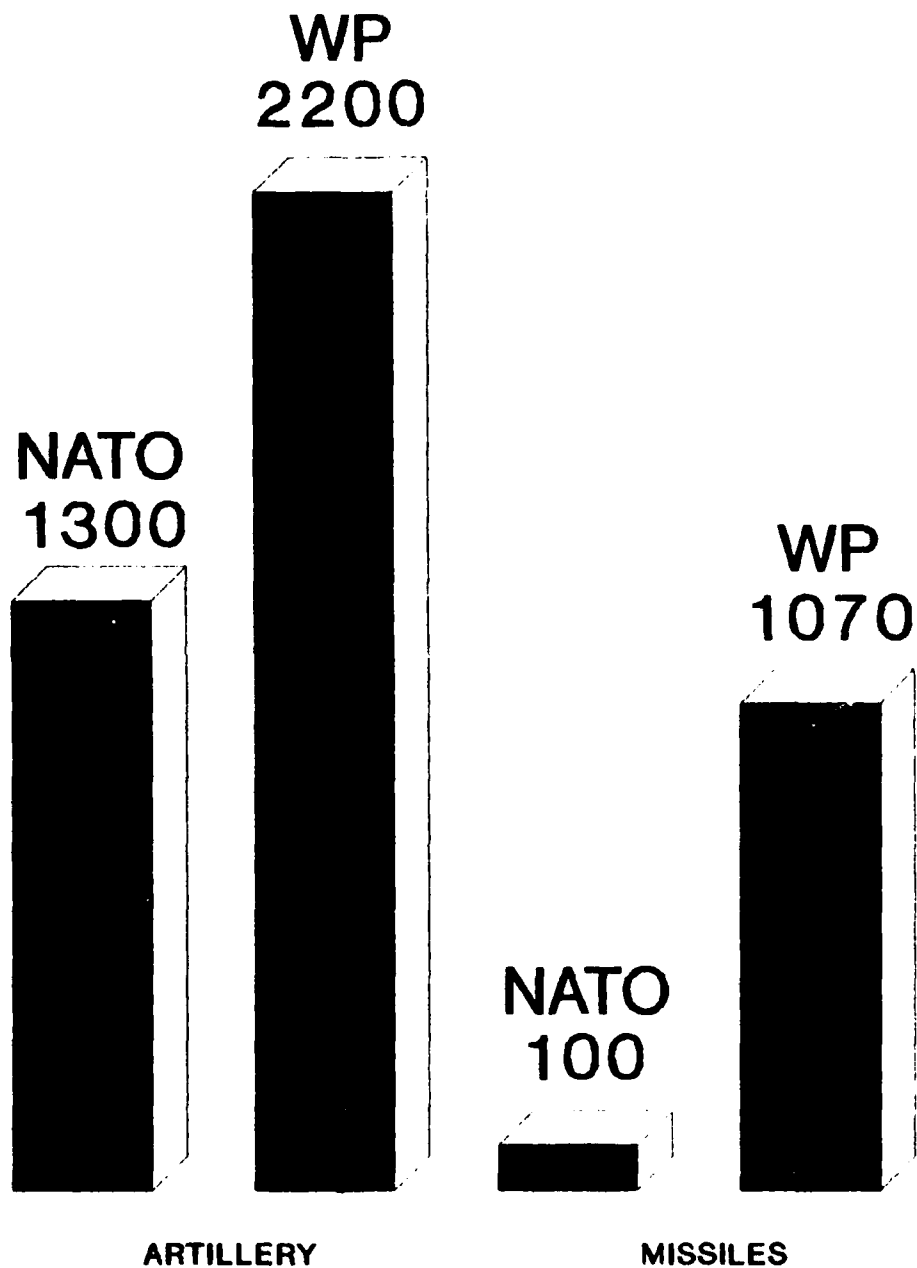
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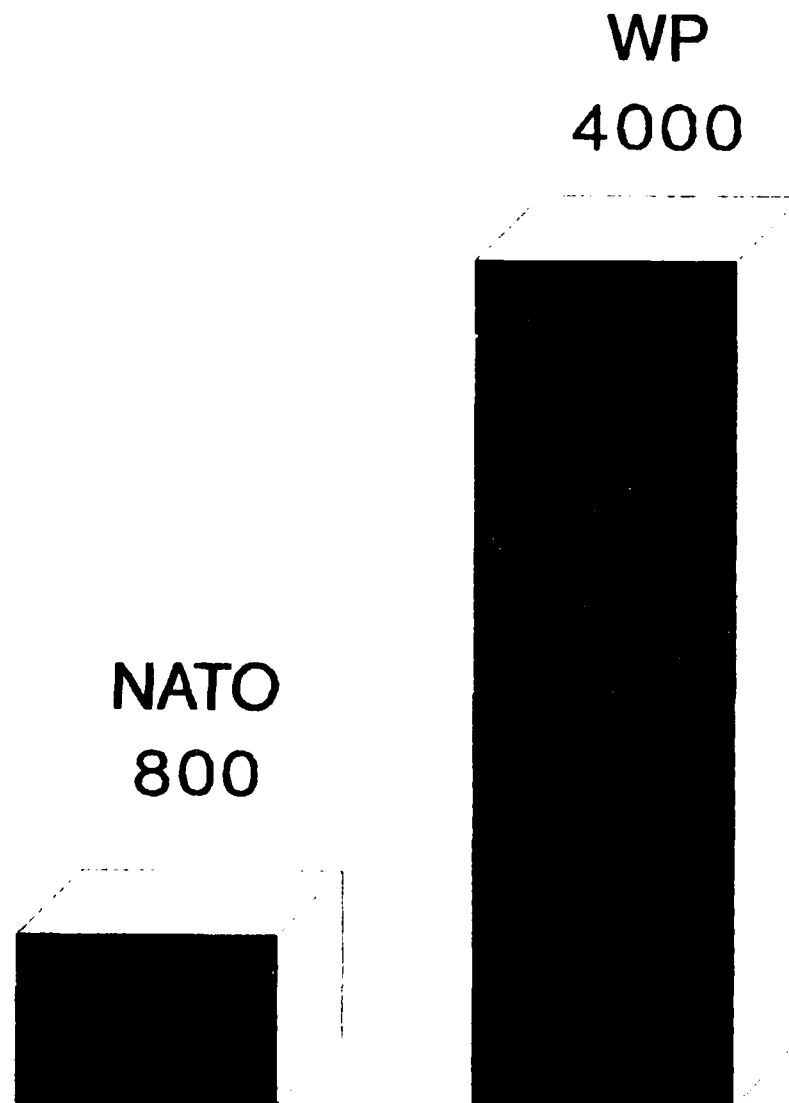
NUCLEAR FORCES



SOURCE: SOVIET MILITARY CAPABILITIES '86

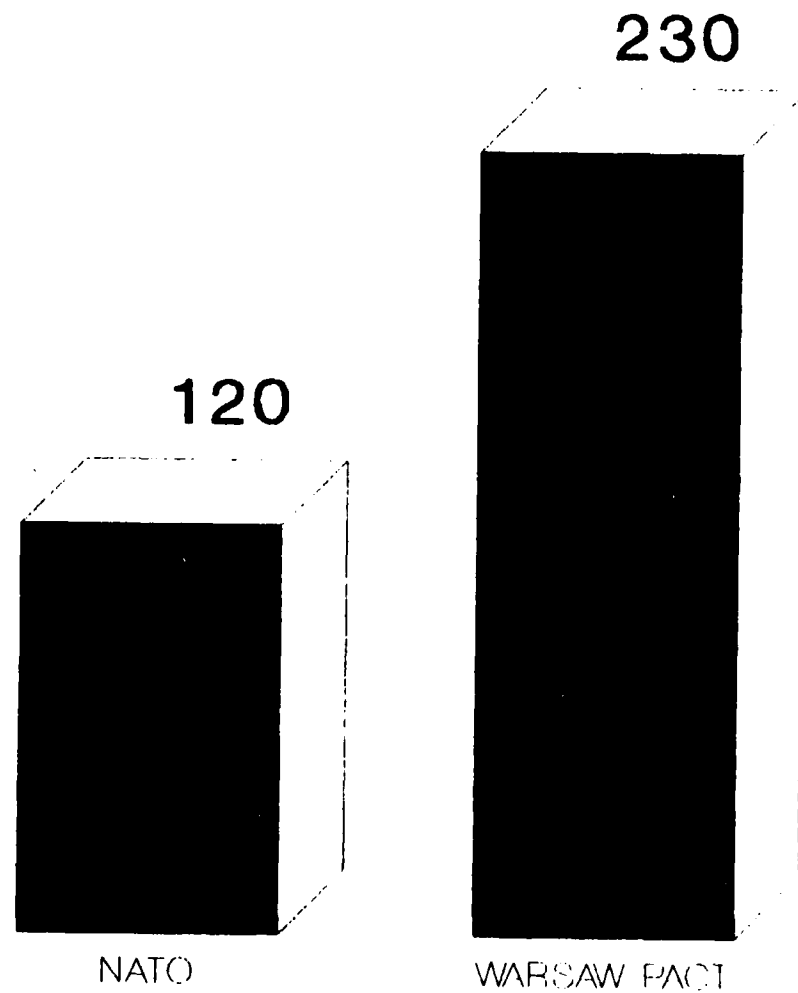
FIGURE 1

NUCLEAR FORCES INF AIRCRAFT



SOURCE: GOVERNMENT MILITARY CAPABILITIES 1996

NATO-WARSAW PACT DIVISION EQUIVALENTS

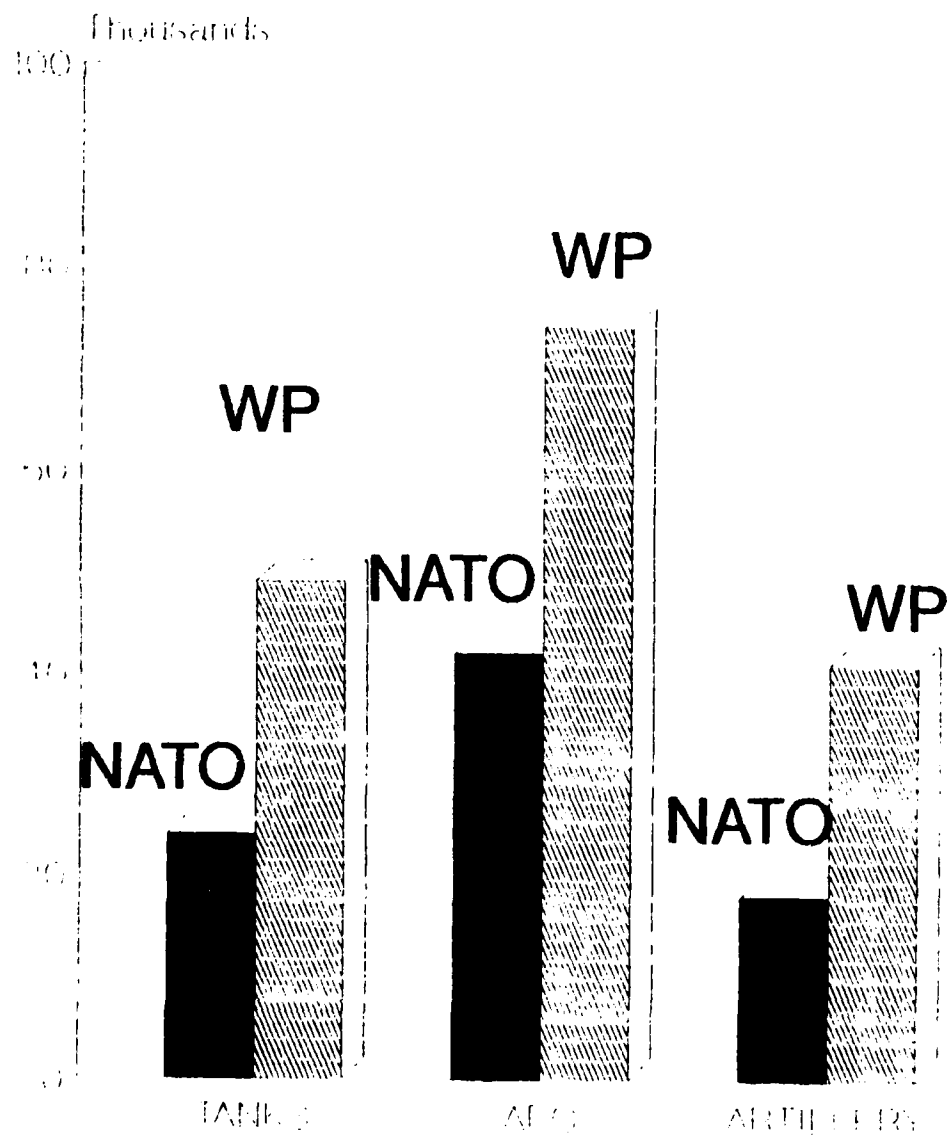


SOURCE: MILITARY POSTURE 1987

REPORT 1

CONVENTIONAL FORCES

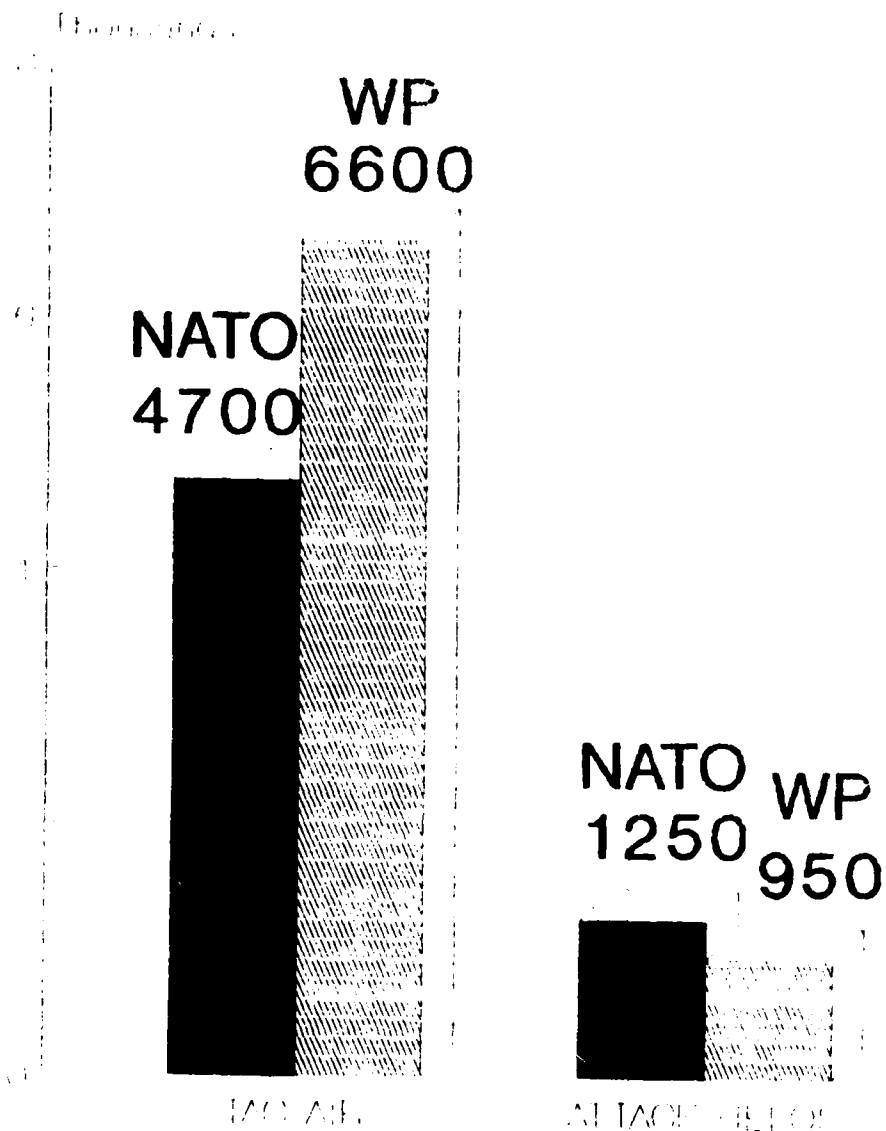
NATO-WARSAW PACT



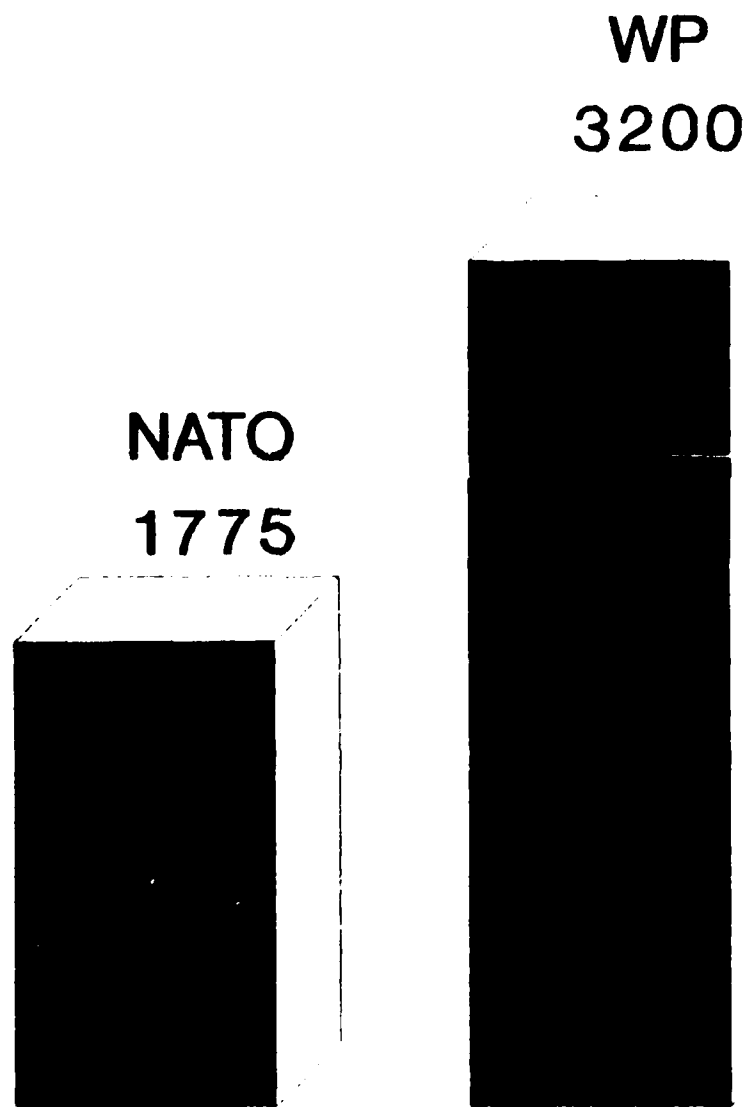
Source: U.S. Army, "The Warsaw Pact Armies," 1977.

CONVENTIONAL FORCES

NATO-WARSAW PACT



AIRCRAFT PRODUCTION 1981-1985



SOURCE: MILITARY POSTURE 1987

FIGURE 6

FORCE MODERNIZATION GROUND WARFARE SYSTEMS

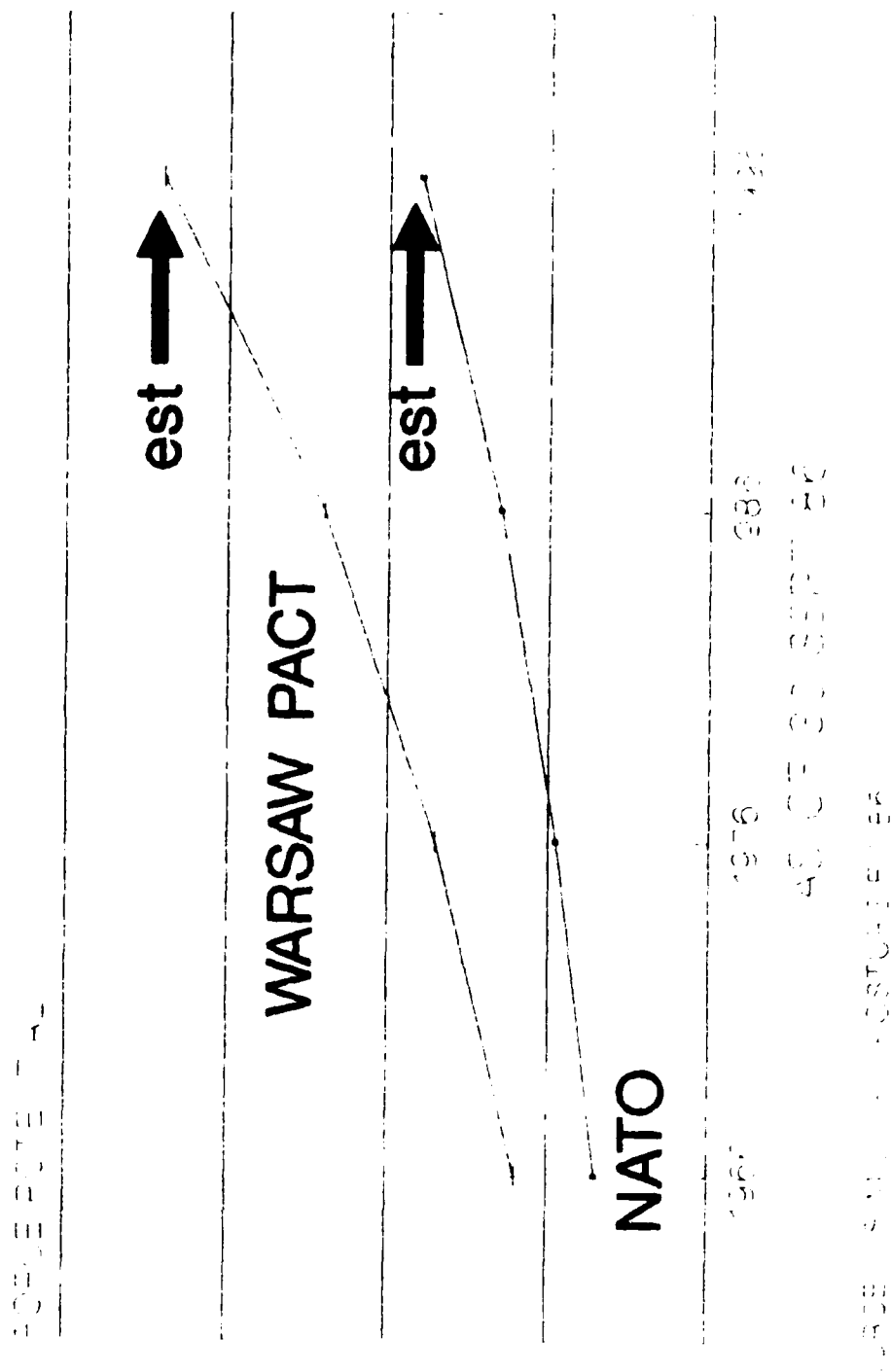
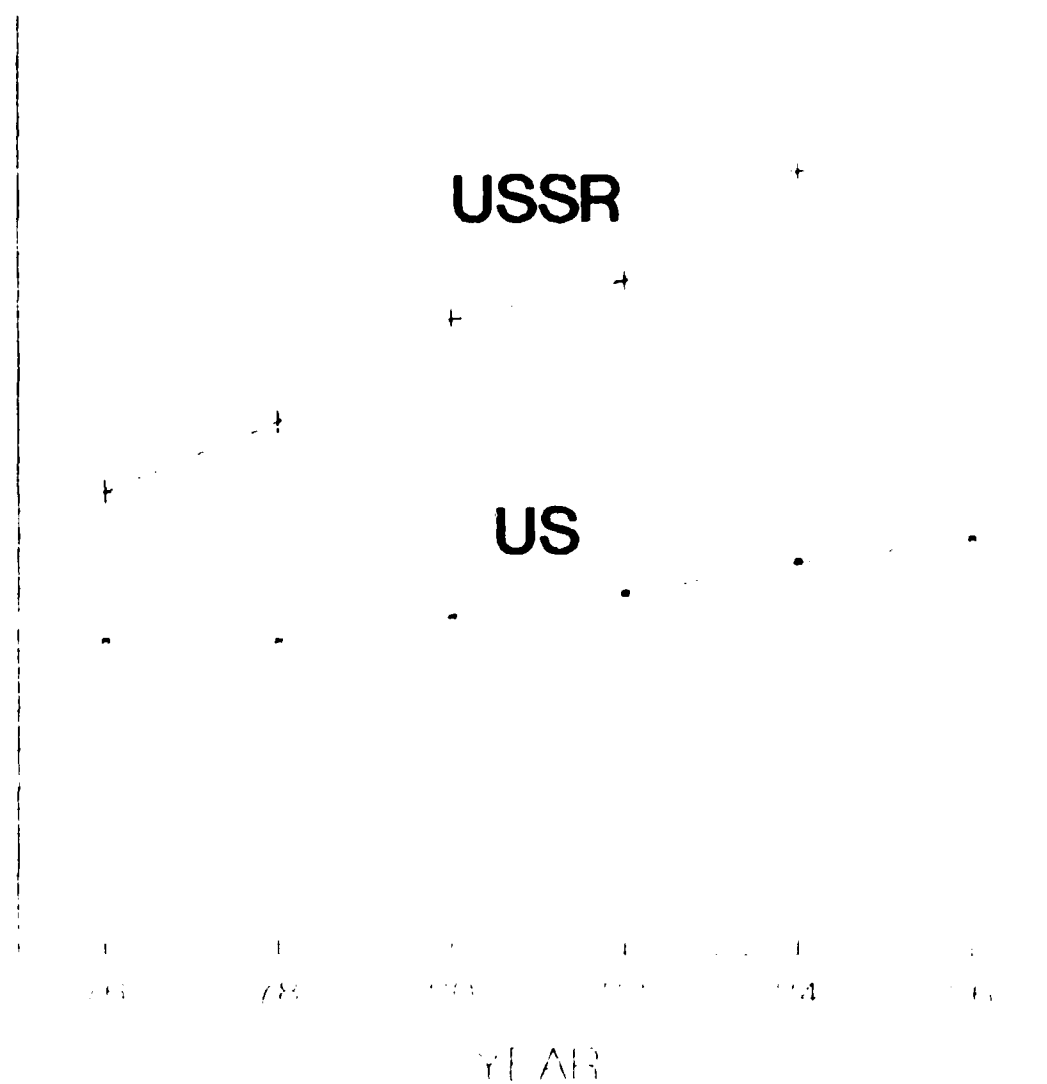


FIGURE 7
59

RESEARCH AND DEVELOPMENT

BILLION DOLLARS



SOURCE: SOVIET MILITARY CAPABILITY, 1979

FIGURE 8

B-52 WEAPONS CARRIAGE

(PARTIAL LISTING)

<u>WEAPON</u>	<u>CLASS</u>	<u>CARRIAGE</u>
MK-82	500	51
M-117	750	51
CBU-58	750	51
CBU-87 (CEM)	750	30
CBU-89 (GATOR)	750	30
MC-1 (CHEMICAL)	750	24
MK-20(CBU)	500	42
AGM-84 (HARPOON)	2000	12
MK-84	2000	18

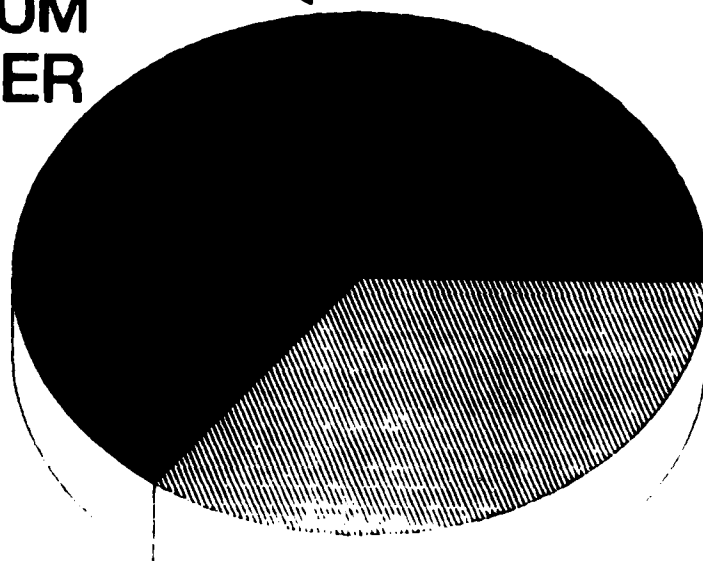
SOURCE: T.O. 1B-52-34-2-1

FIGURE 9

SOVIET INTERCEPTOR CAPABILITIES (1993)

(LOOK DOWN-SHOOT DOWN)

100% CAPABLE
FOXHOUND
FULCRUM
FLANKER



↑
LIMITED CAPABILITY
FLOGGER
FOXBAT

SOURCE: SOVIET MILITARY POWER 1987

FIGURE 10
65

END

DATE

FILMED

DTIC

JULY 88